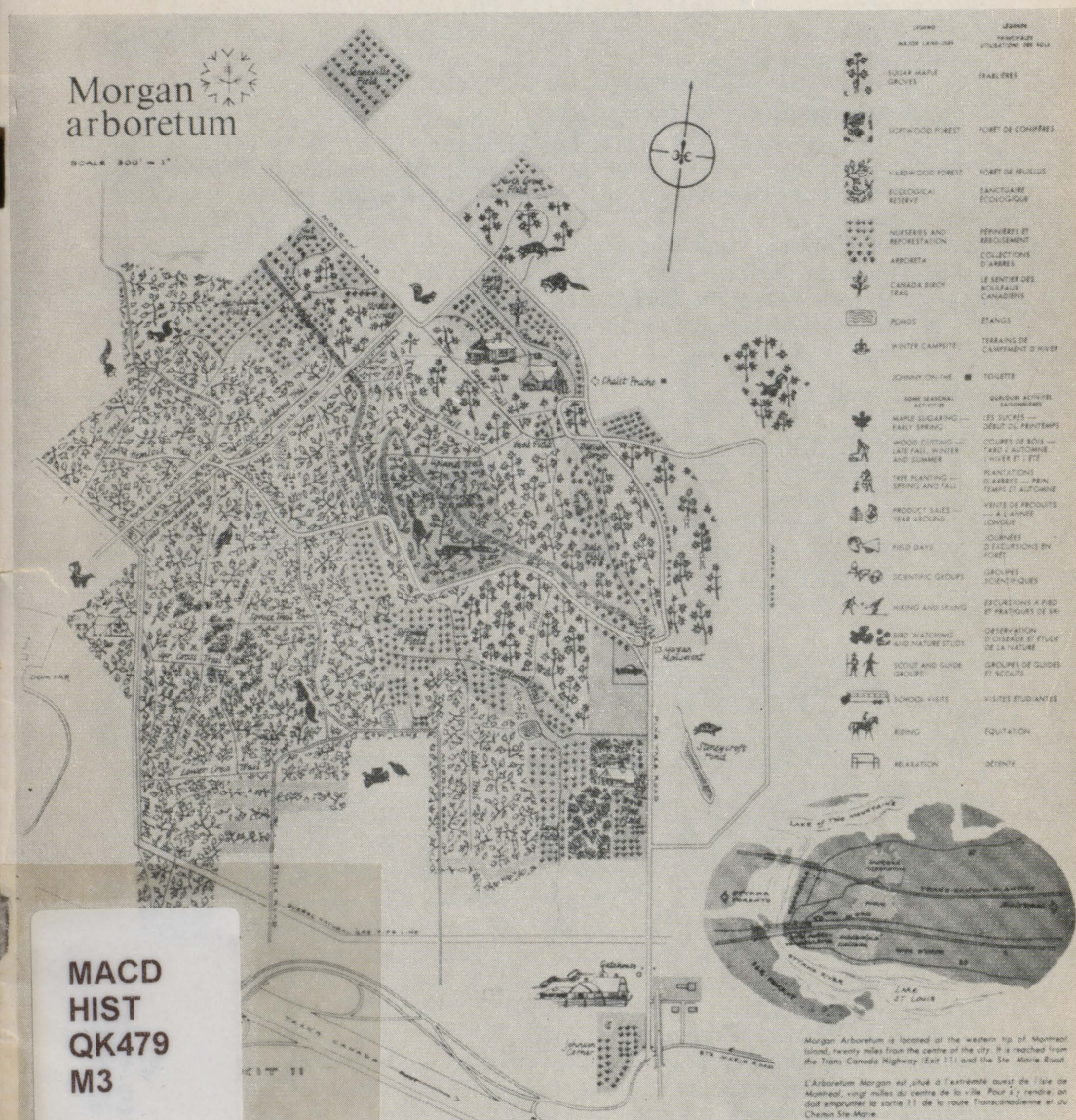


THE
DEPARTMENT OF WOODLOT MANAGEMENT
MACDONALD COLLEGE
AND

THE MORGAN ARBORETUM ASSOCIATION



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ANNUAL REPORT
to MAY 31st, 1966

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MORGAN ARBORETUM AND WOODLAND DEVELOPMENT

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W. H. Brittain, Ph.D. (Cornell). D.Sc. (U.B.C.), B.S.A., LL.D., F.A.I.C.,
F.R.S.C., Scientific Adviser.
A.R.C. Jones, B.Sc.F. (Tor.) M.Sc. (Syr.), R.P.F., F.E., Chairman.
J. R. Bider, B. Sc., M. Sc. (Montr.), — Wildlife Biologist (Huntly-Drummond Fund)
J. D. MacArthur, B. Sc. F. (U.N.B.), Forester and Curator.
R. A. Lord, B. Sc. F. (U.N.B.), Research Forester.
Miss R. S. Abbot, Office Manager, retired-April 30th, 1966.
Miss M. E. Munro-Kerr, Office Manager.
Miss J. A. Olive, Secretary.

Arboretum

Mr. R. J. Watson, Foreman.
Mr. Warren Grapes, Dipl. (Agr.) Resigned — May 20th, 1966.
Mr. G. S. Martin
Mr. H. R. Brevoort
Mr. R. A. Irwin
Mr. D. Ferrie

The DEPARTMENT OF WOODLOT MANAGEMENT MACDONALD COLLEGE

It is a pleasure to present the highlights of the year's activities to the membership. The report which follows covers the period June 1st 1965 to May 31st 1966.

Membership

At the annual meeting last year it was found necessary to suggest a slight dues increase in some of the categories of membership because of continuing and mounting deficits in operating expenses during the past three years. Membership was advised of the proposed changes in September and the revised dues went into effect last November. The changes involved increases of single to \$10, man and wife to \$15, riding membership to \$50 and the institution of a \$5 junior membership (16-20 years). Family membership which includes parents and all their children remained unchanged at \$25 as did corporation memberships and other categories. The co-operation of the membership in undertaking these increases is appreciated. It was felt the services provided to the membership was ample justification for a change and it is gratifying to report that an increasing number of new members and little depletion in the number of past ones has further supported this very necessary move.

It is realized that few of our members join just to benefit from these modest services but in order to support the worthwhile cause of conservation and help focus more attention on natural resources management and development.

The Arboretum continues to attract large numbers of visitors, particularly in the spring and fall. On pleasant days in the winter many hardy visitors come out to ski, to walk, to ride, or just to escape briefly into a peaceful, natural environment from our increasingly urbanized, asphalted and noisy surroundings.

This past year has been marked by the number of persons who have contacted us regarding ways and means of protecting natural areas close to Montreal from casual destruction. That their concern is warranted is borne out by the February, 1966 report from the Service d'Urbanisme de la Ville de Montreal.

The report points out that there are only four areas of woodland reserved for public or semi-public use in or near Montreal. On the Island there are Mount Royal Park; essentially an urban park and not a true forest; and the Morgan Arboretum on the West end of the Island. The other two areas are the Oka Provincial Park, on Lake of Two Mountains and Mount St. Hilaire. The report closes with a "general plea for the conservation of woodlands wherever possible". This is striking proof of what is happening in terms of land use close to a modern city. What more need be said to establish that a critical lack of natural areas exists? The preservation and maintenance of what few wooded areas still remain in this increasingly populous area and even the development of new ones is imperative.

Discussing this problem in his book "Crisis in Our Cities", (reviewed by Norman Pearson, in Canadian Audubon) Louis Herber reminds us that "the ruins of Rome, Bagdad, Timgad and Persepolis are a

sobering reminder that proud civilizations have died before now, and we could go to ruin with astonishing speed in an age where techniques for the destruction of the environment and of man himself are so advanced, yet, responsibility for our surroundings so poorly developed.... The prodigal wastefulness of North American society has been seen as a necessary adjunct of progress."

But Herber calls in question this concept of progress on the ground that activities resulting in new deserts, new dead lakes, new diseases like "urbophrenia", air pollution, water contamination and general destruction of the natural environment are a deadly menace to physical and mental health.

Membership in the Morgan Arboretum Association may be regarded as much more than a personal interest. We would suggest that members have a right to feel that, in addition to the individual benefits obtained, they are collectively responsible for a demonstration of conservation in its best sense. The continued use of the Morgan Arboretum as the site of a wide range of activities, including practical forest management, is a prime example of "Use without abuse".

At the end of the year membership stood at 728 individuals and families; 37, corporations and associations; 19, Honourary memberships and a total of 130 new members in all categories. Membership growth has been quite satisfactory and the contributions of the many members who have supported the association not only through their dues but also through suggestions, time, and effort are much appreciated. In particular the time and interest that Fred Harrison has devoted to the project and the establishment of a public-relations committee has been noteworthy. The very substantial financial assistance provided by the Canadian International Paper Company is also acknowledged with gratitude. To the many other corporations and individuals who have given generously of their time, their talents, and their treasure, please accept our sincere thanks. The active interest that Robert Raynauld has shown in the Arboretum and all its undertakings and the considerable help that he has provided has also been of great assistance to the association. The membership will be pleased to hear that Bob has recovered from an illness that put him in Notre Dame Hospital for a month this spring. At the time of writing this report he had returned to his office and was taking up his busy schedule again with his customary zeal and enthusiasm. It is hoped that he will not let his love of hard work interfere with his need to recuperate completely.

Members will also be sorry to hear that Choppy Dobell has submitted his resignation as vice-president and this has been accepted with regret. His interest and support of a successful membership campaign several years ago and his keen interest with particular regard to woodland owners in the Knowlton area has been invaluable. He has agreed to continue as a director of the association. It is hoped that the membership has found the reprints and news items sent out through the year informative and of interest. This mailing out of information grew directly out of a suggestion proposed by Choppy Dobell at one of the earlier annual meetings. It is also hoped that the information provided over the telephone and the products sold in the Arboretum have all met with the approbation of the membership. It is always appreciated when some item that may be a source of irritation, un-

known to the staff is brought to our attention. It is only in this way that such errors or mistakes in understanding can be corrected. So we rely on you to keep us informed.

This is the first full year of support from the Huntly-Drummond fund and the assistance provided by this fund has been instrumental in expanding the contribution that the Department has been able to make to the teaching of renewable natural resources at the University and in further wildlife projects in the Arboretum. This work is discussed under Wildlife Management below.

The growth and expansion of the Department as well as the upkeep of the Arboretum continues to make heavy demands on the finances of the Association so that a constant need for additional financial support is continually being experienced. The support and interest of the membership and corporations is greatly appreciated.

Staff

This year was marked by the loss through retirement of Ruth Abbott who has coordinated the multitudinous activities of the Association and Department as Office Manager and Secretary for the last 10 years. To say that her services will be missed is a tremendous understatement. She has guided and assisted with the growth of the Department since its early beginnings and has been most helpful at all stages in planning for its continued expansion. She handled her many duties and responsibilities with great efficiency and despatch and her conscientious attitude to the work and in providing services to the membership has been an example to us all. A sample of her keen interest in the Morgan Arboretum is the fact that she has supported the work through membership since its inception in 1952. At a retirement party held for members of the Macdonald College staff on May 17th fitting tributes were paid her by Dr. Brittain, Dean Dion and Principal Robertson and a camera presented as a small memento of the esteem in which she was held by members of the staff. It is hoped that this gift will encourage her continued use of the Arboretum and that we will see her there often, now that she has escaped from the many office chores. I am sure that the membership and our staff will want to thank her most sincerely for her conscientious dedication to the Association and wish her a long and satisfying retirement.

Another significant change was the contribution to the Department made by Roger Bider who commenced his appointment last summer as Assistant Professor of Wildlife Biology supported by the Huntly-Drummond fund. Professor Bider initiated two courses in the Department, namely Wildlife Management and Ecology and Conservation. The response of students to these courses is indicative of their need. Professor Bider also was instrumental in stimulating an exchange of teaching assignments with Professor Pirlot of the Université de Montréal. He also initiated community ecology studies in the Arboretum, which, in addition to its scientific value will be of considerable interest to the many visitors to North maple grove where he established an unique tracking device to record the various animal activities as identified by their tracks and marks left on a fine sand track. This research is, on occasions, hampered by unleashed dogs

who delight in racing down the track leaving excellent imprints of (for example) Rhodesian ridgebacks at full gallop — but effectively obliterates all the smaller tracks which are of major interest! It would be appreciated if all members exercising dogs in the Arboretum would observe the sign requesting that they be leashed near this project. The sand track technique established at the appropriate points has also great potential to determine the number of unauthorized visitors to the property.

Another wildlife project that is being seriously considered and under study for sometime with some assistance from Dr. G. Ihles and Mr. Stephen Bloomer (who has done some excellent art work to outline projects) is the establishment of a natural wildlife park in an appropriate section of the Arboretum accessible to the entrance gate.

The woodlot research programme, in the Arboretum has been pursued very actively this year under the direction of Curator and now Assistant Professor Dan MacArthur. Using data gathered during the past year he has prepared several papers for publication on the wetlands planting study; the effect of paraformaldehyde (PFA) on maple sap production; pulpwood production in a mixed plantation of European Larch and Norway Spruce; research on maple sap collection systems using vacuum pumps and plastic tubing reported in detail below, and the initiation of a management project in a young maple stand to study sap production from the sapling stage to maturity. In co-operation with the Department of Forestry Dan is also conducting studies of Christmas tree species to test selected materials of special value for Christmas tree production. He presented a paper, "Maple Research Results at Macdonald College" at the triennial U.S.D.A. International Conference on maple products at Philadelphia last October. His paper will be published in their Report of Proceedings.

At the same time Professor MacArthur has supervised the multitude of activities within the Arboretum itself such as the numerous plant and tree sales, woodlot harvests and thinnings, maple operations, summer work, plant protection projects, and educational tours and field days for members and many other groups. Most recently the tours of French-speaking 4H youth groups organized by the Department and sponsored by the following firms; Aluminum Company of Canada, Canadian International Paper Co., Domtar, La Ferme, and Consolidated Paper Co., have taken up each Saturday this spring. Professor MacArthur's fluency in French and experience in this work has been of great value in providing meaningful conservation outings for these young Canadians. His presentation of the Department's brief to the Minister of Lands and Forests at the public hearings in Quebec last December met with a most sympathetic audience and furthered interest in the Arboretum's programme of private forestry and land use in Quebec.

In his capacity as consultant editor to Woodlands Review he has kept the Department up to date on developments in the Pulp and Paper industry through field visits to various company operations and technical meetings. The relationship with the industry is a vitally important one if the Department, through its teaching and extension activities is to fulfill one of its roles as a mediator and communications medium between private and industrial forestry interests. Through quiet diplomacy a much needed function is performed.

Dr. Brittain, you will be glad to hear has regained his strength after his illness last winter and is continuing the Birch project with renewed drive and enthusiasm. Although he did not do any extensive travelling last summer because of his health this spring he made a quick trip to the Valcartier Forest Experiment Station north of Quebec City to collect pollen from some of the natural hybrids that exist there to cross with the local collection. Several years of effort have resulted in the granting of a \$9,000 extra-mural research grant by the Department of Forestry to Dr. Bill Grant of the Genetics Department at the College. Dr. Grant has been closely associated with the Birch project working on cytological aspects of the identification of *Betula*. The undersigned took on a recollecting job for Dr. Brittain when a guest of the McGill Subarctic Laboratory at Knob Lake near Schefferville in the Labrador-Ungava last August. The birch specimens collected there in 1962 had not done well and additional ripe seed was required. This involved driving to Sept Iles and taking the Quebec North Shore and Labrador Railway to Schefferville. For those interested in seeing the vast hinterlands of Eastern and Northern Quebec and some of the really dramatic scenery of the North Shore region, this is highly recommended as an economical and extremely interesting and worthwhile trip. The 400-mile railroad connects Sept Iles with the iron ore mining centres of Labrador City, Wabush Lake and Schefferville and was carved out of the Quebec-Labrador wilderness in the early fifties. It is used primarily to transport iron ore from these centres to Sept Iles and Port Cartier and for sea transportation to industrial centres in the United States. After leaving Sept Iles on the first 150-mile stretch the train climbs up through the steep slopes of the Laurentian plateau until reaching the height of land at an elevation of roughly 2,200 feet where the track crosses into Labrador. This point separates the St. Lawrence River watershed from those waters flowing north or east into Goose Bay. This is rugged and scenic country and the railroad is literally pinned to the canyon walls that line the turbulent salmon rivers such as the Moisie, the Nipissis and the Wacouana that drain the southern flanks of this mountainous plateau. From this point onwards the track runs through the flat lands of the Labrador trough, crossing the headwaters of the Hamilton (now Churchill) River at Menihek Lake. This section of the journey enables one to view the extensive areas of organic terrain that characterize the northern part of Quebec's Boreal Forest region — half taiga, half tundra, half water, half bog with substantial stretches of lichen woodlands composed of white and black spruce, balsam fir, tamarack, and trembling aspen, balsam poplar, and white birch. With the willing assistance and hospitality provided by Dr. Peter Adams, Director of the Subarctic Laboratory at Knob Lake and Bruce Findlay, a graduate student in Geography, transportation was provided to make several birch collections in the region and observe stands of birch within 30 miles of Schefferville. On returning from Sept Iles, birch collections were made near Baie Comeau and at Lac à Paul Baie near Forestville. Mr. Ken Greaves, a Director of Woodlands Operations for Anglo-Canadian Pulp and Paper Mills Ltd. at Forestville arranged a truck and aircraft tour of part of the Company's 3,000 square mile limits. These limits include the Sault-aux-Cochons and parts of the Bersimis watersheds and provided an overall view of the details of their pulpwood harvesting operations

in the very rugged terrain that makes up the north shore of Quebec, east of the Saguenay River. Ken's kind assistance and hospitality was much appreciated on this interesting visit.

Following this tour a visit was made to the headquarters of the Bureau d'Aménagement de l'Est du Québec (B.A.E.Q.) at Mont Joli to talk with Dr. Guy Lemieux, then Director of physical resources for this Quebec-ARDA regional planning programme in the lower St. Lawrence and Gaspé. This vast pilot project is aimed at rehabilitating the rural residents of the region through retraining and public participation programmes and through research develop extensive and intensive programmes of efficient alternate uses of the land and water resources of the Gaspé for tourism, forestry, park and outdoor recreation, agriculture, mining and fishing purposes. This original project under way since 1963 was set up to make plans and carry on research with respect to the technical, economic, and social improvement of rural areas in the province using the Gaspé region as a pilot project area.

Mr. Richard Lord completed his survey and report on the attitudes of woodlot owners in Soulanges and Huntingdon Counties to woodlot management for the Department of Forestry in late November. The findings of this interesting study are reported briefly below. Since that time he has been working on a number of reseach projects in the Arboretum. His services have also been invaluable to share the load of extension and conservation education activities which are a continual chore for the Department but an important and integral part of the community service programme. Dick also helped with the organization and conduction of this spring's successful maple research programme and set up a very instructive section of the maple exhibit demonstrating the evolution of maple sap collecting equipment from the early wooden buckets to a modern tubing installation. Following the recent approval of our request for \$10,000 grant for studies of selected woodlot owners in Huntingdon County by the ARDA-administration of the Quebec Department of Agriculture and Lands and Forests, it is planned that Dick will continue to develop this project. The purpose being to study the influence of intensive management assistance on woodlot production in the region.

Once again we are most grateful to the Departments that have assisted us in a number of ways and with many projects and demonstrations during the year. In particular the assistance of the staff of the Agricultural Engineering and the Extension Departments is noted and appreciated. Dr. Dorothy Swales in her work of maintaining and labelling the plant specimens on the Botanical Trial, to Jim Watling for his imaginative design and inspired art work for the new brochure and other items, to Bob Raynauld, Dr. Real Pelletier, and Joffre Dechene for their translation work all deserve sincere and hearty thanks.

The unending and mushrooming load of work in the office and in the Arboretum under the direction of Mr. Bob Watson has been handled capably and well. The fact that all this work is performed by a small but dedicated staff is largely responsible for the continued expanding scope of the Department's activities. I would like to thank all the staff most sincerely for their loyal service and interest in the programme. We are sorry to lose the services of our Forest Technician, Warren Grapes, a Diploma in Agriculture graduate who left us this spring to manage a large farm in Vaudreuil County.

Arboretum

The winter was a bad one for plant life generally and much snow, ice and frost damage was experienced in the Arboretum. With the completion of a thorough survey of our plantings, to be undertaken during the next few weeks, a considerable body of evidence as to the hardiness of the many species tested will have been accumulated.

It has been possible, assisted by the cool, unusually prolonged spring, and a fall off in the area devoted to birches, to carry through a re-organization of the nursery material, which will greatly facilitate maintenance problems in that area.

Progress has been made with the Canada Birch Trail and a collection of representative birches from every province and territory, and a representative collection has been donated to the Faculty of Forestry, Laval University, through Dr. Louis Parrot. Seed and plants have also been presented to the C.I.P. Harrington Forest Farm and the Forestry Experiment Station at Chalk River, Ontario.

Two scientific papers on our birch studies were published during the past season, a third is in press and three more are in a state of advanced preparation awaiting only the addition of a few technical details. Observations on juvenile characters, growth rate and habits is continuing and a certain amount of crossing work has been undertaken, which it is hoped will help clear up a number of problems in identification.

The widespread interest and use of the Arboretum by members and other visitors for family half-day visits has been gratifying and encouraging to the staff. Gatekeeping activities under the direction of Bob Watson showed 4,240 registered visitors on the week-ends between May and October which does not include the many educational groups or visitors that come in during the week. It has become increasingly difficult for Mr. Watson to recognize all the individual and groups that should be allowed to pass. Members are advised to have their membership cards available so that their entry on week-ends can be expedited. Those who are interested in visiting or have been invited to visit as friends of Directors or others it would be most helpful to inform Mr. Watson by means of a letter to save embarrassment and clear up any misunderstandings so that he can allow them to pass at the gate with the least delay. This year saw the publication of a new bilingual, 3-colour brochure designed by Jim Watling which shows in an attractive manner some of the more important features of the property. Because of cost it is not possible to distribute this too generally but it is hoped that the brochure has helped to publicize the essential features and programme and will be useful and of interest to the membership.

Woodland Improvement

Forest operations were restricted to two management prescriptions; the farm owner clear cutting on 1.7 acres in Block XIV and a version of the institutional owner management approach in improvement cutting in the East and Chalet sugar groves of Block XI. Particularly in East Grove, cutting was designed to promote the development of young sugar maple. This is a continuation of the stand improvement work

begun by a first cut some 12 years ago. This young sugar maple stand will become the objective of intensive study as it develops.

Harvesting and stand improvement work fell behind schedule, partly as a result of the demands of the birch planting programme that reached a peak in the fall of 1965. This was unavoidable but we can now look forward to getting back on schedule since the bulk of the birch planting has been completed. Data on wood production are as follows:

Wood Production-1966

Clear cut strip Block XIV. No wood, all brush
East Grove (XI)

	<i>Cords (18" wood)</i>	<i>Cords (12" wood)</i>	<i>Cords (sugar wood)</i>
Students	3	—	2
Arboretum Crew	44½	—	15
Centre Grove (XI)	5½	—	3
Chalet Grove (XI)	18	2	5
	71	2	25

All the wood cut in 1965-66 came from Block XI and may be considered an 'institutional' owner cut.

Approximate area cut over = 10.0 acres, Block XI

1.7 acres, Block XIV
11.7 acres total

A small thinning operation took place in the young white ash stand in Centre Grove (Block XI) in the fall of 1965. This young stand has been gradually brought along by frequent releases and cleanings and is now in the pole stage. Thinning in 1965 was to release the best specimens from competition and to adjust the spacing of potential crop trees.

During the winter considerable advance timber marking was done. Centre (Block XI), North (XVI), and Skinner (Block XII) maple groves were marked for stand improvement with sugar maple management the final objective. In Block I some ten acres were marked for diameter-limit cutting. In this area the forest consists predominately of beech that is unusually defective as a result of fire injury in the past. Fire scars are not conspicuous but can be found on most of the trees and are almost always associated with extensive heart rot. As a result most of the mature stand will be removed.

Maple Research and Demonstrations

The 1966 Maple season was one of those rare, but most welcome, bumper years. A record production of 512 gallons of syrup was reached during a short, but extremely busy, season. Sugar production data for the past ten years show how 1966 compared with former years.

<i>Year</i>	<i>No. of Taps</i>	<i>Gal. of Syrup</i>	<i>Pds. of sugar/tap¹</i>
1957	3,035	467	1.42
1958	3,251	432	1.22
1959	2,692	278½	0.93
1960	2,488	427½	1.58
1961	2,605	281	0.99
1962	2,626 (150 P/L)	309	1.08
1963	2,871 (480 P/L)	374	1.19
1964	2,793 (911 P/L)	353½	1.14
1965	2,850 (932 P/L)	250½	0.81
1966	2,818 (728 P/L) ²	512	1.67

10 year average to 1966: 368.5

1. Gallons of syrup times 9.2 divided by number of taps.
2. Number of taps on pipeline reduced as part of research programme.

The 1966 objective of beginning to tap by February 15 was almost met and this paid off because once again there was an early run of sap in March and 100 gallons of syrup were made. The early run was followed by a cold spell. Sap flow was strong for two periods in late March and early April and the season was over by April 12. This year paraformaldehyde (PFA) pellets were used in all the tapholes as a result of the good effects of PFA in 1965 experiments. Maple sap collection research was continued in 1966 with three experiments being conducted concurrently with the commercial operation.

Yields of sap per taphole from two systems of tubing installation; 1) 18-inch drop and 2) non-drop; both with vacuum pumping, were compared in the North Grove. This test was made possible through a donation by Minnesota Mining and Manufacturing of Canada Ltd. of the extra tubing required to set up the test. The results were startling. The 18-inch drop installation produced 6.6 gallons of sap per taphole versus 2.7 gallons for the non-drop installation, or about 2.4 times as much. This result indicates that the extra cost of using drops is more than compensated for by increased returns. Next we need to determine the minimum effective length of drop.

Sap yields per taphole from buckets and tubing were compared in a formal experiment involving 480 taps; half with tubing and half with buckets. Recorded per-tap yield with tubing was 6.3 gallons of sap versus 5.0 gallons with buckets. Bucket yields may have been reduced slightly by evaporation but never the less it seems clear that tubing yields are at least as good as those from buckets with sap collected by tubing being better simply because of less exposure to contamination.

A small scale test was run wherein yields of sap from holes bored later in the season were compared with those from holes bored earlier and treated with PFA. The new taps gave higher yield (13% more) over the period of the test. However, the new tap rate of flow tended to drop as time passed and by the end of the test there was little difference, if any, between early and late taps. In a similar test in 1965, without PFA in the early tapholes, the late tap yield was much higher and the difference did not decrease with time. Therefore, it seems likely

that PFA was at least partly responsible for the large 1966 yield for the whole operation.

Extensive damage to plastic tubing by squirrels occurred in the North Grove during the 1964 and 1965 seasons. This was expected again in 1966 and Dr. Bider set up two sections of sand track to investigate squirrel activity with a view to devising controls. In 1966, however, there was practically no squirrel damage. But the threat still exists and studies of squirrel activity are planned for this summer and the 1967 season.

A new, long term, and potentially elaborate maple research project is currently being initiated. In East Grove a stand of young sugar maple is developing in response to special thinning and release cutting. This stand is now in an early stage in the development of a sugar grove. Plans are to control its development closely to produce an ideal maple grove in as short a time as possible. Complete records of about 1,000 potential crop trees will be kept and a complete history of tree and stand development built up over the years. The selected crop trees will be numbered and mapped and complete tree records entered on IBM cards. This basic documentation will be useful for various experiments with computer analysis of data available if desired.

The usual three large sugar parties were held in April, namely the Arboretum party which drew well over a thousand members and their guests, the McGill Graduate Society party which was very well attended this year and the Macdonald College Faculty Club party. The latter party was held on a Saturday afternoon and close to 300 staff and their children attended which makes it one of the largest ever for this group. We were most fortunate in being blessed with splendid weather for all these events, which, of course, aided the turnout.

This spring the Department tried something new along the educational line to complement the usual maple research and commercial syrup production programme with a successful venture into youth conservation education.

We have long been aware of the growing interest and demand by schools and other youth groups for educational field trips to the Morgan Arboretum, particularly during the sugaring season. In the past, the combination of a small staff together with lack of funds and equipment has restricted our response to this demand. It was felt however, that an educational demonstration of the entire sugaring process should be made available to interested groups. Thus a programme was designed to show the importance of the maple industry in the provincial economy, the nature of the maple research conducted by the Department, the evolution of modern equipment, and the entire process of syrup production from the tree to the market place.

During the past winter the Department approached for assistance a number of organizations and firms involved in the maple industry with a view to initiating such a programme. Their active response to this appeal led to the construction of a modern sugar house complete with evaporator and storage tanks for demonstration purposes. Several acres of sugar bush adjacent to the main entrance road were set aside to display a variety of collection methods, ranging from early wooden buckets and hand-carved spiles to modern plastic pipeline and collection bags. Conducted tours offered a complete description of all

aspects of the maple industry and concluded with a sample of the final product for each visitor for which a fee of 50 cents was charged to defray costs. In all, over 400 young people ranging in age from Kindergarten to Grade Seven, took advantage of this demonstration. Next spring, these tours will become a continuing part of the activities of the Department.

The generous cooperation of the following organizations in providing both money and equipment is gratefully recognized and acknowledged;

CONTRIBUTORS TO THE EXHIBITION SUGARHOUSE

Minnesota Mining & Manufacturing of Canada Ltd., London	Equipment
Les Producteurs de Sucre D'Erable de Quebec, Levis	500.00
Dominion and Grimm Co., Ltd	Equipment
Société Arés Ltée., Waterloo	\$ 20.00
C. H. Peron et Cie., Ltée., Chomedey	200.00
Small Brothers Ltd, Durham	Equipment
Province of Quebec, Department of Agriculture and Coloniza- tion	500.00
Canada Starch Company Ltd. (For Quebec Maple Products, Lennoxville)	200.00
Les Industries Provinciales Ltée., St. Damien	Equipment
Association Forestière Quebécoise, Inc.	50.00

Another interesting development this year was the formation of a new provincial committee to study the most pressing problems of the maple industry. Formed under the direction of Dr. Bruno Landry, Chef de la Division des Productions horticoles du Ministère de l'Agriculture et de la Colonisation the committee includes producers and buyers of maple syrup, agronomes and forestry engineers. University personnel and others interested in the maple resource. The Department was invited to participate in the first meeting of this new committee which discussed the grading and classification of syrup for 1966, Federal proposals, research, Expo'67, and maple Festivals. It is expected that the work of this Comité de l'Erable can do much to improve standards and communications in the industry and assist with the efficient processing, packaging and marketing of maple syrup in the Province.

Nursery and Plantations

Nursery work

The members' sale of ornamental trees and shrubs, held on May 6 & 7, was highly successful. The sale of prepared orders (92) and unreserved stock, Expo tree sales and special tree sales amounted to approximately \$4,200.

The cool weather preceding the 1966 sale was ideal in that growth was held back and the stock was much less disturbed by handling than is usually the case. The pre-planting of larches in bushel baskets also worked out well. Larch is difficult to handle because of its very early flushing but in baskets it can be transplanted as late as desired with no bad effects. A gratifying feature of the 1966 sale was the in-



Mr Cliche plants a birch

ACTIVITIES

MORGAN AR



Thinned Larch-Norway Spruce



Maple tubing trials

S — 1965-1966

ARBORETUM



Christmas tree field day



Sid Prescott's prize woodlot



Demonstration sugar house

creased demand for white birch and larches, both items that Dr. Brittain has been trying to promote for some time.

The spring of 1966 saw much progress in re-organizing the nursery. Some of the lessons learned through experience, particularly in plant sale preparation, have pointed the way to a more efficient and better controlled nursery operation. With special reference to the annual plant sale two major problems have recently come to light and steps are being taken to minimize their effect. Members will have heard of these and such new arrangements as are made will be highlighted in the 1967 plant sale catalogue.

Reforestation

Reforestation has been reduced by lack of space to specialized planting such as: The planting of the specimen trees in the birch collections and clones of Scot's pine grafts from trees selected as superior Christmas tree stock. The white birch material was grown from seed collected by Dr. Brittain in his Canada-wide birch study. The Scot's pine grafts were obtained from the tree breeding group at the Department of Forestry, Petawawa Forest Experiment Station.

Field planting of birch progressed well in the wet autumn of 1965. In all 112 collections (907 trees) and 138 chromosome-count specimens were planted out in the old Nut Field. Earlier birch planting in the Senneville Field accounted for some 112 collections and 1,100 trees. Finally 36 trees, representing five provinces, were planted on the Canada Birch trial.

From Petawawa 20 grafted clones of scots pine were received; 17 of 10 grafts, two of seven, and one of six. Two plantings were made in October 1965; one in Blossom Corner of five grafts from each clone and a second, using the remaining stock, in the Sand Field as a reserve. Special care will be necessary for this carefully selected plant material and we may hope eventually to have a source of high quality seed for scots pine Christmas trees.

Plantation Management

Shearing to shape pines for Christmas tree production continued. Tests have not revealed any important differences between knife and hedge clipper shearing for this work. But the knife is an easier tool to use. Shearing of red pine has been abandoned for the time being and work will be concentrated on scots pine. The 1966 Arboretum Christmas tree sale was on an expanded scale and met with fair success. All trees were sold in Vexar mesh, pioneered in 1965 at the Arboretum and now being adopted rapidly by growers in Canada and the U. S. The sale of decorative greens consisting of pine boughs was continued as a profitable enterprise. Prunings from Arboretum pine plantations yielded 425 bundles of boughs. These, plus 50 bundles purchased in a trial operation, were sold along with the Christmas trees. Immediate profit from bough sales is high and this outlet permits cultural work in the plantations that we could not otherwise afford. Another advantage is that cull Christmas trees and defective plantation trees may be converted into a saleable product in the form of boughs.

Packaged decorative firewood was a new feature of the 1966 Christ-

mas sale. Small, strapped bundles of white-barked birch firewood were offered and sales were large enough to encourage a further effort along this line. Such wood is not usually considered as good for heating but can be sold for decorative value.

In addition to Scot's pine as Christmas trees some surplus spruce and fir from the Arboretum were also sold. Part of this stock was black spruce from an unsatisfactory plantation. These were sold to a dealer who wished to add variety to his Christmas tree sale.

A second thinning was carried out in a 1950 mixed plantation of European larch and Norway spruce. The first thinning in 1962 removed every third row. In 1965 a further thinning aimed to reduce competition to the most promising specimens of both larch and spruce. About 230 cubic feet of wood per acre (78% larch and 22% spruce) was removed in 1965. Other plantation thinnings have been, and are being, made through sales of large trees for ornamental planting. Not only does this type of sale bring in an immediate return but it also allows a higher level of plantation management than would normally be possible.

Winter Injury

During the winter of 1965-66 there were few, if any, cases of physiological damage in the Arboretum. There was, however, some spectacular mechanical damage caused by over-loads of ice and snow. The damaged trees were in all cases pre-disposed.

In the Pine Field, jack pine were bent or broken along the edge of the natural woods where they had developed an inward lean because of competition for light. In the same area pitch pine were also heavily damaged. This species has a marked tendency to spindly growth. In the Wood Field the alder specimens suffered breakage and again these were leaning because of competition. Some of the larger crowned willows were broken because of the enormous loads of ice and snow that they accumulated. In the red pine plantations and in the mixed plantation of European larch and Norway spruce it was notable that most damaged trees were suppressed specimens with relatively spindly stems. The more robust dominants in the same stands were unaffected.

Plantation Research

1. *Wet lands planting*: A paper on five year survival and growth results for the five ridge and sod-planted coniferous species in the experiment was submitted to the Forestry Chronical for publication in June 1966. Records on this experiment will be continued indefinitely.

2. *Birch leaf miner*: Study of birch leaf miner population dynamics was continued by a graduate student of the Department of Entomology with Arboretum birch plantations being used in the field work.

3. *Cytology of birch*: Dr. Brittain and Dr. Grant continued work on birch cytology and taxonomy. Their first two papers, in the series entitled "Observations on Canadian Birch (*Betula*) collections at the Morgan Arboretum. I. *B. papyrifera* in Eastern Canada and II. *Betula papyrifera* var *cordifolia*" were published in the Canadian Field Naturalist in 1965. The work is continuing and further publications are in preparation.

4. *European larch — Norway spruce plantations*: A study plot was established in this excellent plantation to obtain records of growth and yield in response to treatment. A preliminary report is planned for 1966 publication.

5. *Scots pine varieties*: Colour differences of the several varieties of scots pine being grown for comparison as Christmas tree stock were recorded using the Munsell colour chart. It is planned to continue this and other observations of scots pine and to include the special grafted selections received from Petawawa.

Wildlife Management Programme — Huntly-Drummond Fund

In June, 1965 Professor J. R. Rider began his work on the development of wildlife studies within the framework of the Department of Woodlot Management. Concurrent to his appointment he was fortunate in receiving a National Science Foundation grant for teachers to study desert biology at Arizona State University. On his return from the U. S. in August he set to work on local projects with some newly acquired insights into the problems at hand.

Professor Bider's research hinges on concepts dealing with animal activity. The method used to determine the activity of animals is by means of a very fine sand track. These tracks are narrow strips of sand 3 feet wide and several hundred feet long. Records of the time and place of all tracks of animals are kept and used as basic data along with data concerning the surrounding vegetation and climate. This type of data tells when and where the different species of animals are active, and also gives insight into the why of the problem.

This research tool has permitted the initiation of several projects which are now under way:

At Lac Carré, Quebec, Professor Bider has continued his work on some of the more theoretical aspects of community ecology. In January of 1966 he submitted his Doctorate thesis entitled "Parameters of activity at the ground strata of terrestrial communities". By May all the final requirements for the degree were fulfilled.

In the Arboretum 500 feet of track was installed in an attempt to initiate studies on squirrel damage to the sap pipelines in the North Grove. Although relatively very little work was actually done enough was seen to know what had to be done.

One of the problems in the North Grove was that working quarters were too distant to efficiently keep track of what was going on. A proposed grant for a trailer unit designed for the specific needs of this project was turned down but at this moment it is a pleasure to report that a unit is well on its way to completion and will be used in the Arboretum and elsewhere during the fall of 1966.

After the preliminary studies were made in the North grove a project was outlined and submitted in order to obtain funds necessary to carry out the squirrel damage project. Although initially turned down by April a prospective sponsor had second thoughts and it now seems possible that this research will be supported in the fall of 1966.

During the winter Professor Bider negotiated a professional contract with the Canada Department of Forestry to do a ten-day preliminary study on the predator-prey relations of shrews on larch saw-

flies in Newfoundland. It is hoped that this project will culminate in a research grant which would permit us to eventually work on a problem of great economic importance to the forest industry.

In the spring of 1966 Professor Bider received a National Research Council grant of \$3,500 and a Macdonald Agricultural research grant of \$2,000 to continue his research at Lac Carré, Quebec. With this support three students were hired to carry out work on several allied projects. Other continuing projects that have been under way for four years, three new interesting problems by students; Mr. Paul Thibault is working on his M.Sc. field data. His work involves finding out how streams influence animal activity. The results of this research should be interesting to anybody who has a property with a stream running through it.

Mr. Raymond Sarrazin, a fourth year student from the Université de Montréal, is working on a project which involves finding out how slash piles and old rotting logs affect animal activity. Such questions as to the degree to which these artifacts tend to harbour mice and attract other animals might be very important in future regeneration cutting operations where seeding and planting of seedling trees is proposed.

Mr. Alan Campbell, a fourth year student at Macdonald College, has been working on many facets of insect activity. In this area there are so many problems that he has chosen to gather all data until some pertinent question arises.

Professor Bider wishes to acknowledge the untiring devotion of these students to their respective projects. They work 16 to 18 hours a day, seven days a week with unabashed enthusiasm, which makes one wonder what our youth is coming to!

Teaching Programme and Adult Education

This year two new courses were introduced in the Department's programme namely, Biology 400 — Wildlife Management and Biology 400b — Ecology and Conservation. These courses were organized and taught for the first time by Professor Bider through funds provided by the Huntly-Drummond Fund.

Three students participated in wildlife biology given over both terms, while ten students participated in a course entitled "Ecology and Conservation".

The students in wildlife were introduced to the techniques used in wildlife studies and were familiarized with what has been and needs to be done in this field. Much of the practical field work was carried out in the Arboretum.

The "Ecology and Conservation" courses included many discussion periods and the students were able to hear such people, as Dr. Brown of North Western University and Mr. Mitchel of the Arctic Fisheries Research Institute. On campus Professor Brawn, Broughton, Douglas, Jones, and MacKenzie all participated in informal discussions relating to the many different aspects of conservation. In addition the two continuing courses in Woodlot Management and Farm Forestry were given as in the past. The appointment of a wildlife biologist to the Department and this broadening of the courses offered has permitted some development into the field of renewable natural resources. In view of these additional courses the Department felt it was desirable

to change its name from Woodlot Management to Resources Management. This proposed change was approved by the Faculty of Agriculture but was unfortunately rejected by a Senate committee as being too broad.

A third course given by Professor Bider this year was "Comparative Vertebrate Morphology". He taught this during the second term as he was able to make a teaching exchange with Dr. Pirlot of the Université de Montréal. Dr. Pirlot, a professional morphologist and author on the subject, taught the course during the fall term at Macdonald while Professor Bider taught sections dealing with reptiles, birds and mammals in a course called "Les Grands Groupes d'Animaux" at the Université de Montréal in March and April of 1966.

During the fall term the usual field trips were made to Harrington Forest Farm and the Arundel High School Tree Farm. These field trips included the Wildlife students this year and add considerable practical knowledge to the information the students receive in the classroom and the Arboretum. The kind co-operation of these organizations in making the necessary arrangements is gratefully acknowledged. The Diploma students, in addition to their regular courses in Farm Forestry are given an opportunity to carry out a woodlot project on the home farm. This year Sid Prescott of Bulwer won the Vernon E. Johnson woodlot award for the best executed farm woodlot project. A close second was Stephen Coote whose farm is located near South Durham. Both students had selectively thinned an acre of woodlot and left an untreated acre of the same cover type as a control to follow the effects of the thinnings. Mr. Prescott's plot was an excellent improvement thinning for the development of a young sugar bush while Mr. Coote treated a vigorous softwood stand. Both winner and runner-up received hard hats and winter liners from Leavitt Safety Equipment. This is the seventh year that the C.I.P. woodlot award has been made and the sponsoring of it by the company is much appreciated.

In the field of adult education the woodlot forestry conservation course was held this year at Macdonald College and 12 lectures were given covering Tree Identification, Woodlot Protection, Silviculture, Reforestation and Plantation Management, Water Conservation, Wildlife Management, Landscaping with native plants, Mapping and Wood Measurement, Woodlot Management and Marketing. Field trips included in this course were made to the Harrington Forest Farm, the Southern Canada Power Co. Forest Tree Nursery and the Morgan Arboretum. The final field trip in late November was in the form of a field day in the Arboretum "The Christmas Tree Industry To-day" which featured Christmas tree culture and plantation management, packaging and sales which terminated with a chain-saw demonstration, courtesy of Homelite Chain Saws, and warm-up in Chalet Prûche, and a visit from Santa Claus complete with Christmas tree!

A repeat of the evening course in Woodlot Conservation is scheduled to be held in the Physical Sciences centre on the McGill campus this fall, commencing September 29th.

The Department has also been carrying on an active programme of field trips and tours through the Morgan Arboretum for visiting scientists and many others interested in renewable natural resources and land-use, including many educational groups. In addition to Quebec 4H youth visits, 220 Ontario 4H members were toured through the Arboretum last summer. The Arboretum has been used frequently by the staff

for field trips for Scouts and Guides to help them qualify for Conservation, Naturalist and Woodsman badges and was also used by Onyx Films for the production of a modern version of a film on the maple industry.

In September the Minister of Lands and Forests for the Province of Quebec, the Honourable Lucien Cliche officiated at the ceremonial planting of a birch tree from Quebec on the Canada Birch Trail. He also addressed a gathering of Directors, members, representatives of the Town Council Ste. Anne de Bellevue and others. His visit was most useful in getting greater interest and support for the work of the Association drawn to the attention of the important forestry and lumber interests which were present on that occasion. Later that same month an international group of scientists representing the International Union of Forest Research Organizations led by Dr. D.R. Redmond of the Canada Department of Forestry were given a tour of the Morgan Arboretum. This group was followed by the Deputy Minister of Lands and Forests, Mr. Fernand Boutin accompanied by Mr. Roch Delisle, Director of Forestry Extension in the Province. It was a pleasure to have these gentlemen visit the Arboretum and their interest in the work was most encouraging. A very important event for the Department was the formal presentation of its brief in French on the potentialities of private forestry in the province at the public hearings on the revision of forestry legislation presided over by the Minister of Lands and Forests. The brief suggested measures to increase returns from the private forest resource and was summarised in last year's annual report.

Through its staff members the Department maintains a continual correspondence which includes answering daily telephoned enquiries from land owners and others on the various topics associated with resource management with particular reference to forestry and Wildlife management. Of special interest among those organizations visited, addressed or advised verbally or in writing this past year were the Rotary Club of Montreal; the Canadian Tree Farmers' Association; L'Association Forestière Québécoise; The National Film Board (Film Strip Unit, Forestry and Land-Use Film Programme); CIBA — Canada; CBC — Country Calendar Programme; CBC Farm Radio Broadcast; personnel of the Quebec Department of Agriculture and Colonization interested in maple research and members of the staff of the Ontario and Forests Department, Kemptville District; Professor MacArthur attended the Northeastern Forest Tree Improvement Conference at Albany, New York which included a field trip to Cooxrox Forest where D. B. Cook of the New York state Department of Conservation has been experimenting with exotic larches for 30 years. Some of Cook's special larch selections are growing in the Morgan Arboretum. He also attended the Canadian Pulp and Paper Association seminar at Quebec City on "The Forest and Mechanical Harvesting", a field trip to Domtar Newsprint Ltd. selective cutting operations in Balsam fir and the Laval University experimental forest in Laurentide Park was part of the programme. This field trip also included a visit to the Canada Department of Forestry Research Laboratory in Quebec City and several staff visited the Faculty of Forestry, Laval University, during the year as well as attending the student organized "Semaine Forestière". Professor Bider spoke to the Quebec Society for the Protection of Birds "Conservation in the

21st Century" and the Canadian Institute of Forestry, Champlain section, on "Forestry and Wildlife". Professor MacArthur spoke to the South-western Protestant Settlement Society on "New Trends in the Maple Industry", addressed two sessions on "Forestry as a Career" as part of Town of Mount Royal High School career night programme and presented a paper in French "Practical Plantation Management" at the Eastern Township Forestry Association annual meeting in Drummondville. Professor Bider accepted a directorship in the Montreal Anglers and Hunters Inc. Professor MacArthur was made a member of the National Forest Management Committee chaired by Mr. Des Crossley of Hinton, Alberta.

Members of the Department also participated in the open meeting of the Forestry Study Unit in Ontario; The National Forestry Meeting convened by the Federal Minister of Forestry Mr. Sauvé; The Thirtieth North American Wildlife and Natural Resources Conference in Pittsburgh; The U. S. Department of Agriculture triennial Conference on Maple Research in Philadelphia; and the Quebec Women's Institute Leadership forum.

The staff have also attended the following annual meetings; the Woodlands Section, Canadian Pulp and Paper Association; Quebec Wildlife Federation; The Canadian Institute of Forestry at Port Arthur; La Corporation des Ingénieurs Forestiers de la Province de Québec; Canadian Forestry Association, the Conservation Council of Ontario's Water Resources Management Conference; Montreal Anglers and Hunters; The 56th Pacific Logging Conference; the Centennial Commissions Community Improvement and Rural Beautification seminar; and the Quebec Provincial Council of Boy Scouts of Canada.

Public Relations Activities

This past year under the direction of President Fred Harrison a public relations committee was formed to review and explore the possibilities of expanding the individual, corporation and government support of the Association. The first meeting of this committee was held in September and the following corporations and groups were represented; The Aluminum Company of Canada, Domtar, Royal Trust, La Ferme Inc., Imperial Tobacco Co., Consolidated Paper Co., Ste. Anne de Bellevue Town Council, Publicité Services, Canadian International Paper Co., 4H representative in the Montreal region, M. Gilles St. Gelais and some of the Directors of the Morgan Arboretum Association and staff of the Department. The representatives attending were given a tour of the Arboretum followed by a meeting in Chalet Prûche. Two sub-committees were formed at this meeting, Gilles St. Gelais, Norman Dann and Aime Gagné to represent youth activities and Alan Duckett, Roger Bourgon and Joffre Dechene to represent the Industry programme.

In April another meeting of the Committee was held at the St. James Club to report on progress. At this meeting in order to outline terms of reference for the industry sub-committee the principal objectives for the Association were summarized as follows:

1. To improve woodlot management practices on private forest lands, and by so doing to increase the production of wood and other goods and services, such as game, outdoor recreation, etc. from these lands.

2. To stimulate a greater awareness of the pressing need for proper husbandry of all the renewable natural resources of forest, wildlife, soil and water, including outdoor recreation. With increasing pressures for multiple use of forest lands it is vitally important that all our citizens become aware of the need for the intelligent use and protection of these lands.

3. The need through adult education to broaden public awareness of the Nation's dependance on the forest resource and the economic benefits that flow from the forest.

Gilles St. Gelais reported for the Youth Committee that he had arranged for seven 4H groups of approximately 50, 13-16 year old children to visit the Arboretum commencing in mid-May. These visits have now commenced and the young visitors have been shown the conservation programme in the Arboretum, provided with a lunch followed by a tour of the dairy barns at Macdonald College. These outings appear to be much appreciated by the youngsters taking part and we are most grateful to the organizations sponsoring these educational visits for a worthwhile effort.

Other events taking place this year that can be classified as public relations were the provision of specimen birch trees from our Canada wide collection for Orly Airport in Paris. The Air Canada news release stated in part;

"Ten silver birches, native to each of Canada's provinces, were flown by Air Canada recently to be planted at the opening ceremonies of the new Orly Hilton, at Orly near Paris. The trees, a gift from the Morgan Arboretum of Macdonald College were presented by Dr. W. H. Brittain, Scientific Advisor to the Arboretum and one of Canada's best known woodsmen. Dr. Brittain feels that the Canadian birch is really the tree that best symbolizes Canada, for it was the existence of the birch which made possible the opening of perilous trails across the breadth of the country, in fact the original spare part service. The Orly Hilton is opening a special international garden with trees from each country whose airlines serve Paris."

An uniquely appropriate symbol was used by Saguenay Shipping Ltd. to commemorate the launching of their new vessel the "Sunmaple" in Norway recently. Saguenay made arrangements through the Arboretum, and the Norwegian Consul to present each of the guests at the launching with a pair of maple trees — a red maple and a Norway maple.

A fir was also provided for the topping-off ceremonies at the Canadian Pulp and Paper Association pavilion at Expo this spring. An interesting article by Dorothy Eber entitled "W. H. Brittain The Man Who Collects Canada's Trees" recently appeared in Montreal '66 and comment has been coming in from many quarters on this story which is published in both French and English.

Woodlot Ownership Research

A Woodlot Ownership Survey carried out by the Department was completed late in 1965 with the submission to the Federal Department of Forestry of a comprehensive report. The 18 month government financed study examined the relationship between the woodlot ownership

pattern and the management practices of the owners in Soulanges and Huntingdon counties.

A preliminary report describing the objectives and methodology of the study and the findings in Soulanges County was included in the Departments 1965 Annual Report. Briefly summarizing the conditions in Soulanges, it was noted that the woodlots are small, most frequently owned by low income, part-time farmers and considered of little economic value. They were found to be heavily cut over in the past, unprotected and in poor condition. Firewood is the principal product cut, and often the only product available in any quantity. Little interest was shown in improvement work or reforestation.

During the late spring and summer field work continued in Huntingdon county where some 200 owners were visited and interviewed. Their responses were analyzed during the fall and the final report prepared late in the year.

The findings in Huntingdon were somewhat more encouraging. There, the woodlots are larger and more numerous, better-stocked, and reflect a somewhat higher degree of utilization than those in Soulanges. Considering the two counties as a whole it was noted that:

"Few woodlot owners consider the woodlot an important or integral part of their property. The majority of woodlot harvests are unplanned. Little consideration is given to sustained yield or future production. Clear-cutting, high-grading and pasturing are common. These detrimental practices combine to reduce the owner's chances to gain any continuing benefits from their woodlots. They are at once the result, and the cause, of widespread disinterest in a potentially valuable resource."

However, a minority of owners in both counties were found to possess the required combination of resources both natural and economic, and the entrepreneurial ability and interest to develop a profitable enterprise based on the production of wood and maple products. The required element commonly lacking is the knowledge of sound forestry principles and techniques to achieve this improved level of management. The information developed in this study should enable various agencies such as the Provincial Department of Lands and Forests and the Department of Woodlot Management help fill this gap. One such programme which would offer free technical assistance and professional management to interested owners of woodlands in Soulanges and Huntingdon counties is now under consideration.

A new study to implement some of the findings of the above was proposed to the Quebec C.P.A.R. committee last fall for ARDA assistance. This project entitled "The Influence of Management Assistance on Woodlot Production" will commence this summer supported by a grant from the Federal-Provincial ARDA committees.

The objectives of this research are to learn the potentialities for increased wood production and income from farm woodlots and private forests through more knowledgeable management activities by the respective owners. Information and technical assistance will be provided to a limited number of interested owners of woodlands of 50 acres or more.

The project is proposed:

- 1) to help provide information on the role that woodlots and private forests can play in regional resources development.
- 2) because of the need for more woodlot productivity data following intensive management assistance.
- 3) to gain more precise data on the economic aspects of woodlot forestry when the owner is aware of the various alternatives to maximize income or minimize losses.
- 4) to capitalize on the results of a 1964-65 study in southwestern Quebec on the attitudes of owners to woodlot management.

The county of Huntingdon has an approximate total private forest land area of 40,000 acres. The potential productivity from this forest land is estimated at nearly 20,000 cords of wood annually. The 1960 estimates of wood products cut in the county show 9,000 cords of wood produced, less than half the estimated potential.

No financial assistance is suggested other than the inducement of improved production from their holdings. A minimum of one year's field work will be required to initiate the research project and contact the 50 to 100 owners. A further period of at least 4 years will be necessary in order to maintain the technical aid and to assess the effectiveness of the assistance and the results in terms of wood production, management effort and income.

Publications

During the past year, in addition to the many public addresses, guided tours, advisory visits and field trips the members of the Department have prepared and published the following articles;

- Brittain, W. H. and W. F. Grant: Observations on Canadian Birch (*Betula*) collections at the Morgan Arboretum. *I. B. papyrifera* in Eastern Canada. *The Canadian Field Naturalist* 79 (3), 1965, pp. 189-197.
- *II. B. papyrifera* var. *cordifolia*. *The Canadian Field Naturalist* 79 (4), 1965, pp. 235-257.
- Bider, J. R. Wildlife on the Farm. *Macdonald Farm Journal* February 1966 pp. 9-10.
- "Parameters of Activity at the Ground Strata of Vertebrate Communities." Ph.D. thesis accepted as partial fulfillment for the Degree of Doctor of Science, University of Montreal.
- Jones, A.R.C. "Du Rôle Primordial de la forêt dans la Conservation des eaux." *Forest Conservation* September 1965, Vol. XXXIV (7), pp. 33.
- "Escape from Magalopolis". Address to Rotary Club of Montreal, December 14th, 1965, pp. 1.
- "The Team Approach to Resource Management" (Editorial). *Macdonald Farm Journal*, V. 25 (2) 1966. pp. 4-5.
- "Education for Resource Use". *Montreal Gazette*, March 12th, 1966. pp. 1.

- Lord, R. A. "Private Forest Landownership in Soulanges and Huntingdon Counties, Quebec." Mimeographed, Department of Woodlot Management, Macdonald College, November, 1965, pp. 122.
- "The Farm Woodlot-Who Owns it?". *Macdonald Farm Journal*, Vol. 27 (2), February 1966, pp. 5-7.
- MacArthur, J. D. A release experiment in dense ten-year-old balsam fir in Gaspé. *Woodlands Review - Pulp and Paper Magazine of Canada*, September, 1965, pp. WR 395-400.
- Early returns from red pine plantations, *Macdonald Farm Journal*, November, 1965, pp. 7, 8. Reprinted in *Le progrès Forestier*, Mai-Juin, 1966, pp. 7.
- Maple research - A progress report. *Macdonald Farm Journal*, February, 1966, pp. 6, 7, 9.
- Planting trees on wet land. *Macdonald Farm Journal*, February 1966, pp. 8 and 21.
- MarArthur, The Forest and Mechanical Harvesting-Report on Woodlands Section, Canadian Pulp and Paper Association, Seminar. *Woodlands Review - Pulp and Paper Magazine of Canada*, October, 1965, pp. WR 426-436.
- The Challenge of Complete Utilization-Report on 56th Pacific Logging Congress. *Woodlands Review-Pulp and Paper Magazine of Canada*, December 1965, pp. WR 529-531.
- South of the Border-Many Problems Similar-Report on American Pulpwood Association. Annual Meeting. *Woodlands Review - Pulp and Paper Magazine of Canada*, March, 1966, pp. WR 133-139.
- Ten editorials for *Woodlands Review - Pulp and Paper Magazine of Canada* From September 1965 to May 1966.

The majority of the above publications are available on request from the Department office.

Future Plans

In addition to the many continuing research projects in maple and birch reforestation woodlot and wildlife management to mention a few, there are several interesting projects which are now in the early planning stages.

At the request of many interested people plans for a natural wild-life park in the Arboretum are under consideration. To date with the co-operation of the staff and people such as Mr. Gerald Ihles and Mr. Steve Bloomer have made preliminary drawings and established the general lines of the project.

The projected park is an entirely new concept whereby it is hoped to make people aware of the fullness of the animal world which sur-

rounds them. The idea is aimed at youth with the thought that what interests children will also interest their parents.

Fish, amphibious reptiles, birds, mammals, insects and plants will all be part of the exhibits. If you have never noticed the intriguing spider wasps, hover flies and tiger beetles at work in sandy areas it will be possible to see and recognize them in this park. If one has never had a fish-eye view of other fish, turtles, frogs and aquatic insects in a pond it is planned to show them in this park. If you have never had the chance to see and learn the great variety of mushrooms, common to our woods this will be your opportunity.

The displays will be arranged in units along a winding path which will go below ground as well as up into the trees and over a pond. It is planned that there will be little walking and a lot of opportunity to see things. Hopefully the low cost of small unit displays will help to secure the funds necessary to develop the whole complex.

There have also been several interesting properties offered to the Department for research use and for other scientific purposes. It is planned to carry out inventory studies of the flora and fauna on a five-acre woodlot near Monk's Point this fall. Negotiations have also been underway with respect to the study and possible use of a 400-acre property in the Laurentian foot-hills near Dalesville which has a great deal to offer from the point-of-view of forestry, fish and wildlife and water conservation.

Plans for a suitable outdoor laboratory and work space in the Arboretum have been prepared and submitted to the Macdonald College sub committee of the Senate Committee on Development.

It is hoped that before long these plans will result in a suitable laboratory building in the Arboretum.

The willing assistance of the staff in the preparation of this report is gratefully acknowledged.

Yours faithfully,
A.R.C. Jones
Chairman
Department of Woodlot Management

May 31st, 1966

Form of bequest

The Directors wish to remind friends of the Morgan Arboretum Association that the financing of the Association's activities is dependent on their generosity to provide funds to maintain and expand conservation in Canada.

It is suggested to those in a position to do so, the addition to their will of a particular legacy in the following form:

"I bequeath to the Morgan Arboretum Association, Macdonald College, as a particular legacy, and free from all succession and death duties of any kind, the sum of \$....."

Inquiries concerning bequests, other gifts to the Association, or additional information, should be addressed to :

The Secretary-Treasurer,
Morgan Arboretum Association
Macdonald College
P. Q.

